

**Cape Cod.**—A fleet of fifteen or more vessels were frozen in during the latter half of the month.

Harbors and rivers were first freed from ice on the following dates: 22d, Sandy Hook; Louisville, Ky., (closed sixteen days;) 23d, Detroit, Mich.; Dutch Island, R. I.; New Haven, Conn., (closed fourteen days,) Newport, R. I.; 24th, Pittsburgh, Penn., Washington, D. C.; 25th, Morgantown, W. Va.; Tarentum, Penn., (closed fifty-three days,) New York bay; 26th, Springfield, Mass., St. Louis, Mo.

## TEMPERATURE OF WATER.

The maximum and minimum temperatures of the water are given in the table on Chart No. II. The temperatures of the bottom water have been on the average above that of the air for the following stations: *Atlantic and Gulf stations.*—Eastport, 15°; Portland, 10°; Wood's Hole, 7°; New London, 7°; New York, 4°.5; Jacksonville, 4°; Punta Rassa, 6°; Mobile, 0°.5. *River stations.*—Pittsburgh, 12°.5; Louisville, 6°; Knoxville, 7°.5; Nashville, 3°.5; St. Louis, 6°; Cairo, 4°.

The average temperature of the air and bottom water has been sensibly the same at Wilmington, Augusta, Charleston and Key West.

The water temperatures have been lower than the air at Savannah, 1°; Memphis, 1°.5; Shreveport, 1°; Galveston, 1°, and Indianola, 1°. Throughout the month the water from New Jersey to Nova Scotia has been from 28 to 34° in temperature.

## ATMOSPHERIC ELECTRICITY.

(1) *Thunder Storms.*—Storms accompanied by electricity, with hail, prevailed very widely on the 23d, 24th and 25th. The general distribution of the storms for the month is shown by the fact that they occurred on the 2d, in Ga., Tenn., Ala. and Ind.; 3d, in Ga. and Tenn.; 10th, Ala. and La.; 11th, Ga.; 19th, La.; 20th, Kan.; 22d, Kan. and La.; 23d, Ala., Ga., Ill., Ind., Iowa, Kan., Ky., Mich., Mo., Neb., N. C., Tenn. and Wis.; 24th, Ala., Ga., Ill., Ind., Ky., Me., Mich., N. Y., N. C., Ohio, Penn., S. C., Tenn. and Va.; 25th, Ala., Ga., Mass., N. C., Tenn. and Va.; 28th, Ill., Ind., Kan., Mo. and Tenn.

(2) *Auroras.*—The principal auroras of the month were those of the 26th and 28th. The former, as seen at stations in the West, was more finely developed than as seen in New England; it was observed over an unusually large area. In detail, auroras were visible as follows: On the 3d, in Tex.; 6th, N. Y.; 7th, Me., Minn., N. Y., Vt., and Mich.; 9th, N. J.; 14th, Mo.; 18th, Vt.; 24th, Conn. and Me.; 25th, N. Y. and Va.; 26th, Me., Vt., N. H., Mass., Conn., N. Y., N. J., Penn., Del., Md., Va., W. Va., Can., Fla., Tenn., Mich., Ind., Ill., Wis., Minn., Iowa, Neb. and Kan.; 27th, Iowa, Ill., Md., N. Y., N. J., Va. and Tex.; 28th, Me., Vt., N. Y., Conn., R. I., Mass., Tenn. and Ind.

## OPTICAL PHENOMENA.

(1) *Solar Halos.*—The record of solar halos for this month is unusually large, even for so cold a month; they were observed as follows: 1st, Mass. and Ala.; 2d, N. Y., Ga., Conn., Mass., Del., N. H. and Pa.; 3d, Minn., Ala., Ill., Ind., Iowa, Kan., Mass., Mo., Neb. and Va.; 4th, Col., Tex., Mich., Iowa, Ind., Ill. and Ala.; 5th, Ala., Ind., Neb., N. Y. and Wis.; 6th, Ill., Ind., Iowa, Kan., Neb., N. H., Ohio, N. H., Tenn. and Wis.; 7th, Mass., Minn., Conn., Ill., Me., N. H., N. Y., Pa. and Wis.; 8th, Ind., Tex., Ill., Me., Mass., Mich., N. H., N. Y., Pa. and Vt.; 9th, Ga., Ill., Ind., Me., Mass., Mich., N. Y. and Wis.; 10th, Neb., N. Y., Pa. and Va.; 11th, Minn., Ill., Ind., Iowa, Neb. and Wis.; 12th, N. M., Del., Me., Mich., N. J., N. Y., Ohio and Wis.; 13th, Mass., Mich. and N. Y.; 14th, Mass. and N. M.; 15th, Ind., N. H. and N. Y.; 16th, Minn., Col. and Mich.; 17th, Mass., Ind., Iowa, Kan., Mich., Neb., N. Y. and Ohio; 18th, Mass., N. Y., D. C., Ill., Ind., Mich., Pa. and Wis.; 19th, Me., N. H. and N. Y.; 20th, Iowa; 21st, D. C., Pa., N. J., Mich. and Wis.; 22d, Ala., Neb., N. H., N. Y. and Wis.; 23d, Mass., Pa., W. Va., Conn., Del., Md., N. H., N. Y. and Wis.; 24th, Iowa, Kan., Me., Neb. and Wis.; 25th, Neb.; 26th, Iowa, Neb. and Ohio; 28th, Ala., Ga., Tenn. and Va.

(2) *Lunar Halos*.—Full moon occurred February 20, and lunar halos were generally observed over comparatively small areas, the most important one being that of the evening of 18th, when the entire country was covered by a layer of cold, damp air, which was almost simultaneously precipitated as rain or snow on the morning of the 19th at every station from which reports were received. The record for the month is as follows: 3d, Minn., Ill., and Kan.; 4th, Ill.; 7th, Ill.; 9th, Ind.; 10th, Md., D. C., Va., N. J.; Del., Me., Mass., N. H. and Pa.; 11th, Wis.; 12th, Tenn., Mich., S. C., Tex., Ga., Kan., Neb., N. Y. and Pa.; 13th, Va., Tenn., Pa., Conn., I. T., N. M., Md., Mo., N. Y., N. C., Ohio, S. C.; 14th, Ala., I. T. and N. M.; 15th, Va., Tenn., N. H., N. Y., N. C. and Utah; 16th, Ga., Pa., W. Va., Miss., Iowa, Kan., Mich., Mo., Tenn. and Wis.; 17th, Mass., Me., Ind., N. C. and Tenn.; 18th, D. C., Del., Md., Mich., N. H., N. J., N. Y., Ohio, Pa., Tenn., Vt., W. Va., Conn. and Mass.; 19th, Neb., Mich. and N. Y.; 20th, Iowa, Ill., Ind., Minn., Neb., N. J. and Ohio; 21st, Mich., Wis., Ill. and Ohio. 22d, Mass. and Mich.; 25th, Kan.; 26th, Tenn. 27th, N. H.

(3) *Mirage*.—Mirage was observed in Kansas, at Atlanta on the 3d, 4th, 5th, 8th, 14th, 15th, 26th, 27th, 28th, and at Ellenwood on the 4th, 7th, and 8th.

### MISCELLANEOUS.

(1) *Zoological*.—*Blue Birds* were observed at New London on the 23d; Fort Gibson, 21st; Welborn, Fla., 20th; Burnt Mills, N. J., 22d; Bethel, Ohio, 22d; Jacksonsburg, Ohio, 24th; Vandalia, N. J., 25th. *Robins*.—New London, 23d; Fort Gibson, 21st; Hinsdale, Mass., 14th; Lynchburg, Va., 15th; Mt. Sterling, Ill., 20th; Bethel, Ohio, 22d; Vevay, Ind., 24th. *Frogs*.—Prospect Hill, Va., 3d and 25th; Hacienda Saluda, S. C., 20th and 24th; Troy, Ala., 23d; Cleveland, Tenn., 24th. *Seals*.—New York outer bay seen on several occasions. *Larks*.—Welborn, Fla., 12th, moving north; Bethel, Ohio, 22d; Hudson, Mich., 23d. *Wild Geese*.—Wilsonville, Ala., moving north, 19th; Wet Glaze, Mo., moving north, 20th and 21st; Cave Spring, moving north, 21st; Brook Haven, Miss., moving north, 26th; Holton, Kan., moving north, 27th; Corning, Mo., moving north, 27th; Alto Vista, Va., moving north, 27th; Wilsonville, Ala., moving north, 28th; Le Roy, Kan., (geese winter here;) Warrensburg, Mo., 20th to 27th, flying north and south. *Brant Geese*.—Le Roy, Kan., 20th. *Wild Ducks*.—Louisville, Ill., going north, 26th and 28th; Warrensburg, Mo., flying north and south, 20th to 27th. *Mocking Birds*.—Welborn, Fla., 22d. *Killdeer*.—Le Roy, Kan., 22d. *Cat Birds and Black Birds*.—Bellefontaine, Ohio, 23d. *Bees*.—Bethel, Ohio, 24th; Pennville, Penn., 25th. *Cranes*.—Prospect Hill, Va., 24th. *Buzzards*.—Bethel, Ohio, 28th.

(2) *Meteors*.—The most remarkable meteor of the month is that which actually fell on the 12th in Iowa, a fragment of which, weighing seven pounds, was found near Homestead, and is preserved in the cabinet of the State University. Brief notices are at hand regarding bright meteors from the following States: 1st, New Jersey; 3d, New York; 5th, Georgia; 7th, Wisconsin; 9th, Georgia; 12th, Illinois, Iowa, Minnesota, Nebraska, Kansas; 14th, Indiana, Pennsylvania; 21st, Pennsylvania, Florida; 24th, Missouri, Louisiana; 26th, Minnesota; 27th, Indiana, Wisconsin, Florida; 28th, Vermont.

(3) *Polar bands* are recorded on the 4th and 14th at Atlantic City; 19th, at North Platte; 15th, at Milwaukee; 21st, at Cleveland.

(4) *Zodiacal light* was observed on the 1st, in Ohio, and on the 7th, in Indiana.

(5) *Earthquakes*.—A severe shock of earthquake was felt on the 7th, at San Francisco, at 10:56, A. M., lasting from two to four seconds, and followed by another at 11:50, A. M., lasting about the same length of time. No damage is reported.

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